

Lake Lacawac, Bruce R. Hargreaves, Lehigh University (brh0@lehigh.edu, http://www.lehigh.edu/~brh0)

13Apr09: Station moved from dock from 2:30-3:30pm (problems with ice-shift anchors result in wind direction error until corrected on 10Jun09)

The water level sensor (referenced to dock) settles for several days after moving platform to lake center and thus underestimates water level during this period.

Adjusted Tw sensors 13Nov07 based on comparison of depths and vs PUV & YSI sonde profiles (note that Tw at 11.3m matches PUV Tw at 12.5, probably within sediment boundary layer)

Tw12 adjusted to match others on bottom after moved to dock

H310 sensor depth & Lake level are based on differential pressure

sensor with ca 0.1mm resolution & vertical position referenced to bottom of lake.

Sensor PSIG converted to depth using density of water at 40C (1.43321 ps/m)

Dock level is referenced also to lower frame of dock at SE corner (2003-May2005)

(Actual water level at dock varies seasonally with density of water column and hourly from precip, runoff, evaporation, seepage & outflow. Outflow also varies with status of beaver dam).

		5280 ft/mile 1609.3 m/mile																																																							
		Tair avg F		Tair max		Tair min F		Rain-in		WS-mpH		WS max mpr																																													
		59.2		67.2		51.4		1.98		3.9		26																																													
Month summary		Tair avg-C		Tair Hi-C		Tair Mi-C		RHair-%		Rain-mm		WS-m/s		WS max m/s		WDIR-deg		Barom-mb		Sum Rad W/m2		Sum PAR μMm2/s		Tw 0.1m		Tw 0.5m		Tw 1m		Tw 2m		Tw 3m		Tw 4m		Tw 5m		Tw 6m		Tw 8m		Tw 10m		Tw 12m		H310_z (m)		Lakelevel-mm (40C)		cumul. rain-mm		Batt min-V		RH% CR10 enc		RH% MUX enc	
month (All)		15.1		19.6		10.8		86.3		50.3		1.8		11.7		26.4		968.3		435902548		902		20.1		20.2		20.2		20.0		19.7		19.3		16.1		11.8		8.1		7.4		7.4		10.2		-54.4		50.3		12.6		19.8		35.0	

Data

Location		% records		Date		Day of Yr		Tair avg-C		Tair Hi-C		Tair Min-		RHair-%		Rain-mm		WS-m/s		WS Max-WDIR-		Barom-mb		Sum PAR		Sum Rad J/m2		Mol/m2		Tw 0.1m		Tw 0.5m		Tw 1m		Tw 2m		TW3m		TW4m		TW5m		TW6m		TW8m		TW H310-C		TW12m		H310 depth-m (40C)		Lakelevel-mm (40C)		cumul. rain-mm		Batt min-V		RH% CR10 enc		RH% MUX enc	
LC	100%	9/1/2009	244	13.5	20.6	6.5	80.3	0.0	1.2	5.1	195	974.1	24377731	50	23	23	22.5	22.2	21.9	20.6	14.7	11.2	8.0	7.4	7.4	10.2	-29.9	0.000	12.7	15.5	28.3																																
LC	100%	9/2/2009	245	15.3	22.4	7.7	80.2	0.1	0.9	4.1	190	974.3	23930525	49	23	23	22.3	22.0	21.8	20.6	14.7	11.2	8.0	7.3	7.4	10.2	-34.1	0.100	12.7	16.3	29.2																																
LC	100%	9/3/2009	246	16.4	23.9	9.6	83.2	0.1	1.0	5.0	190	970.3	22665774	47	23	23	22.5	22.0	21.7	20.5	14.8	11.3	8.0	7.4	7.4	10.2	-38.0	0.200	12.7	16.8	29.7																																
LC	100%	9/4/2009	247	17.1	25.4	11.2	84.4	0.1	1.1	5.1	189	965.3	19118082	40	23	23	22.7	22.2	21.8	20.5	14.9	11.3	8.0	7.4	7.4	10.2	-41.7	0.300	12.6	16.8	30.0																																
LC	100%	9/5/2009	248	18.3	24.0	12.6	80.5	0.0	1.6	7.3	280	970.8	21795732	45	23	23	22.8	22.3	21.9	20.4	15.0	11.3	8.0	7.4	7.4	10.2	-45.5	0.300	12.6	17.5	30.8																																
LC	100%	9/6/2009	249	16.7	21.6	11.7	83.5	0.0	1.5	6.5	169	975.3	20966662	43	23	23	22.8	22.4	22.0	20.4	15.1	11.4	8.0	7.4	7.4	10.2	-49.5	0.300	12.6	16.9	31.0																																
LC	100%	9/7/2009	250	16.2	19.2	14.3	90.1	0.0	1.3	4.5	184	973.3	8380936	18	22	22	22.3	22.2	21.9	20.4	15.2	11.4	8.0	7.4	7.4	10.2	-53.3	0.300	12.6	16.6	32.7																																
LC	100%	9/8/2009	251	16.8	22.5	12.3	90.8	0.1	0.9	4.5	175	969.0	16045288	34	22	22	22.0	21.8	21.7	20.4	15.2	11.4	8.0	7.4	7.4	10.2	-55.7	0.400	12.6	18.4	32.5																																
LC	100%	9/9/2009	252	17.4	21.5	13.9	88.3	0.0	1.3	5.2	145	970.8	14041788	29	22	22	22.2	22.0	21.7	20.4	15.3	11.4	8.0	7.4	7.4	10.2	-58.5	0.400	12.6	18.5	33.3																																
LC	100%	9/10/2009	253	13.1	15.8	9.5	93.6	0.7	1.6	4.8	164	976.9	14947130	30	21	22	21.6	21.5	21.5	20.4	15.4	11.4	8.0	7.4	7.4	10.2	-62.5	0.400	12.6	16.3	31.7																																
LC	100%	9/11/2009	254	12.8	14.6	10.6	96.5	8.0	3.1	9.4	55	970.7	2746977	6	20	20	20.5	20.4	20.4	20.6	15.5	11.5	8.0	7.4	7.4	10.2	-62.6	8.400	12.6	15.4	32.7																																
LC	100%	9/12/2009	255	16.6	19.7	14.6	97.5	9.4	2.0	6.6	100	964.4	7643437	16	20	20	19.8	19.7	19.6	19.8	15.7	11.5	8.0	7.4	7.4	10.2	-52.4	17.800	12.6	20.3	35.8																																
LC	100%	9/13/2009	256	18.1	21.8	14.7	87.6	0.1	2.3	8.9	315	963.4	17104975	36	20	20	20.0	19.9	19.7	19.7	16.0	11.6	8.0	7.4	7.4	10.2	-49.3	17.900	12.6	21.9	35.6																																
LC	100%	9/14/2009	257	16.2	20.8	13.3	88.5	0.1	1.9	8.0	280	963.7	18119500	38	20	20	20.1	20.0	19.7	19.8	16.2	11.7	8.1	7.4	7.4	10.2	-52.3	18.000	12.6	20.6	35.3																																
LC	100%	9/15/2009	258	17.4	21.2	13.5	86.9	0.0	1.9	6.2	283	964.1	14305823	30	20	20	20.2	20.0	19.8	19.8	16.3	11.7	8.1	7.4	7.4	10.2	-54.9	18.000	12.7	21.3	35.3																																
LC	100%	9/16/2009	259	13.1	17.3	11.2	78.2	0.0	2.2	8.1	86	976.9	14947130	30	21	22	21.6	21.5	21.5	20.4	15.4	11.4	8.0	7.4	7.4	10.2	-56.9	24.700	12.6	18.4	35.3																																
LC	100%	9/17/2009	260	11.9	15.5	10.0	95.0	6.2	1.7	5.6	123	972.3	8986084	19	19	19	19.2	19.1	19.1	19.2	16.5	11.7	8.1	7.4	7.4	10.2	-49.0	30.900	12.6	19.0	36.9																																
LC	100%	9/18/2009	261	15.1	20.2	9.9	83.3	0.0	2.1	7.8	274	967.0	16896724	35	19	19	19.0	18.9	18.7	18.8	16.8	11.8	8.1	7.4	7.4	10.2	-49.8	30.900	12.6	20.8	35.4																																
LC	100%	9/19/2009	262	11.6	17.7	6.1	73.9	0.0	2.1	7.0	305	972.6	21816931	44	19	19	18.7	18.7	18.4	18.6	17.1	11.9	8.1	7.4	7.4	10.2	-53.5	30.900	12.6	19.5	34.2																																
LC	100%	9/20/2009	263	12.5	21.4	4.1	79.2	0.1	1.1	4.3	218	974.8	21238927	42	19	19	18.5	18.3	18.2	18.4	17.0	11.9	8.1	7.4	7.4	10.2	-57.2	31.000	12.7	20.1	32.9																																
LC	100%	9/21/2009	264	14.3	21.0	7.0	85.3	0.1	1.3	6.2	191	974.3	19953073	41	19	19	18.8	18.3	18.2	18.3	17.0	12.0	8.1	7.4	7.4	10.2	-60.1	31.100	12.6	20.9	34.3																																
LC	100%	9/22/2009	265	17.8	20.1	15.1	92.7	0.3	1.2	5.4	205	973.6	5019887	11	19	19	18.9	18.5	18.2	18.3	16.9	12.1	8.1	7.4	7.4	10.2	-62.1	31.100	12.6	22.2	36.7																																
LC	100%	9/23/2009	266	21.1	25.4	18.3	89.6	0.0	1.7	6.1	222	969.6	12561524	27	19	19	19.2	18.7	18.3	18.3	16.8	12.2	8.1	7.4	7.4	10.2	-63.2	31.100	12.6	26.4	37.9																																
LC	100%	9/24/2009	267	19.0	21.6	14.7	84.3	0.0	2.1	7.1	306	967.4	13063851	27	20	20	19.9	19.1	18.4	18.3	16.8	12.3	8.2	7.4	7.5	10.2	-64.2	31.100	12.6	26.2	38.5																																
LC	100%	9/25/2009	268	13.4	17.1	9.2	75.0	0.0	2.0	8.8	162	972.3	19658606	40	19	19	19.5	19.4	18.7	18.4	16.7	12.3	8.2	7.5	7.5	10.2	-67.5	31.100	12.6	23.0	37.0																																
LC	100%	9/26/2009	269	10.2	14.1	4.9	89.0	8.4	1.9	8.4	184	971.7	11501467	24	19	19	18.8	18.7	18.6	18.4	16.7	12.4	8.2	7.5	7.5	10.1	-70.5	39.500	12.7	18.9	34.8																																
LC	100%	9/27/2009	270	14.8	18.6	11.1	97.4	9.2	2.0	7.5	183	954.5	7165106	16	18	18	18.3	18.2	18.1	18.2	16.8	12.5	8.2	7.5	7.5	10.2	-59.0	48.700	12.6	23.0	45.8																																
LC	100%	9/28/2009	271	14.7	18.7	11.3	88.3	0.8	2.0	8.7	221	949.5	11055742	23	18	18	18.1	18.0	17.9	18.1	17.0	12.6	8.2	7.5	7.5	10.2	-56.7	49.500	12.6	24.4	47.8																																
LC	100%	9/29/2009	272	11.7	13.9	9.5	82.3	0.8	2.9	11.7	238	950.8	9796728	20	17	17	17.6	17.5	17.4	17.6	16.9	12.7	8.2	7.5	7.5	10.2	-61.7	50.300	12.6	21.3	42.4																																
LC	100%	9/30/2009	273	8.1	10.7	4.9	90.3	0.0	2.6	7.8	292	959.5	5512817	12	17	17	16.7	16.6	16.6	16.8	16.6	13.1	8.2	7.4	7.5	10.2	-61.7	50.300	12.6	19.7	53.3																																

Lake water & energy budget daily summary from hourly data (negative values: loss from lake; runoff & seepage term is residual after adjusting lake level change for all others)

Ratio of lake watershed to lake area:		3.88		Runoff & seepage as % of watershed area precip:		24.4%																															
Grand sum/avg		15.11		20.10		20.18		20.17		19.95		19.72		19.33		1.6		435902548		-59231		-35.7		50.3		47.4		-87.2		-10.6		-36.0					
Data		DATE		DayOfYr		AvgTair-C		AvgTw 0.1m		AvgTw0.5		Avg Tw1m		Avg Tw2m		Avg Tw3m		Avg Tw4m		AvgWS		SumRad		SumH Evap		Sum Lk. l/ chg (mm)		SumRain		Sum Runoff & seepage, mm		Sum Lake evap (mm)		Sum Terrepvap2=AirV PD.mbar*WS.m/s*sc		Sum Out flow (lake mm)	
9/1/2009	244	13.48	22.52	22.57	22.54	22.16	21.94	20.64	1.1	24377731	50	23	23	22.5	22.2	21.9	20.6	14.7	11.2	8.0	7.4	7.4	10.2	-29.9	0.000	12.7	15.5	28.3									
9/2/2009	245	15.25	22.74	22.67	22.31	22.04	21.76	20.63	0.8	23930525	49	23	23	22.3	22.0	21.8	20.6	14.7	11.2	8.0	7.3	7.4	10.2	-34.1	0.100	12.7	16.3	29.2									
9/3/2009	246	16.38	22.71	22.60	22.51	22.04	21.74	20.54	0.9	22665774	47	23	2																								